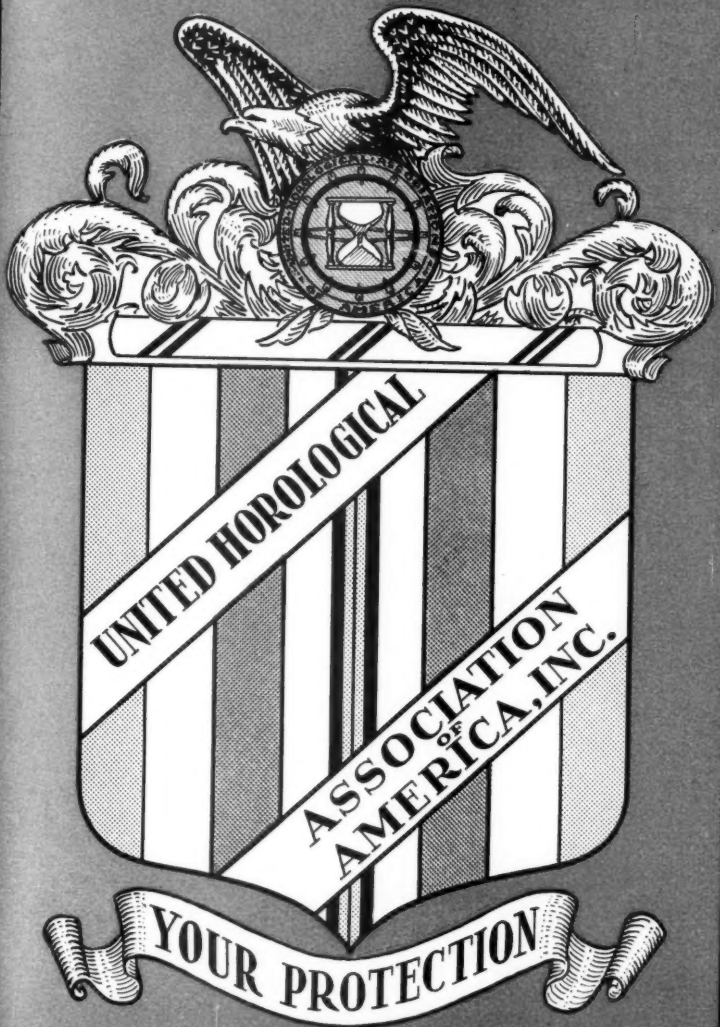
The AMERICAN HOROLOGIST

OFFICIAL NATIONAL PUBLICATION



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THE AMERICAN HOROLOGIST

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Contents

	Page
Co-Operation, by D. L. Thompson	5
The Oil Question, by George T. Gruen	8
The Staking Tool	9
Mainsprings and Position Rates, by Jos. A. Biemel	19
Astronomic Watch	20
Beauty and Art from the Past	21
Making Laps for Pivot Polisher, by Harold C. Kelly	24
Freeport Watch Company, by Harold J. Frisbie	26
Modern Shop Equipment, by D. L. Thompson	28
Connecticut Clock Factory	29
Moral Responsibility of the Man at the Bench, by J. P. Sommer	30
The Time and Way to Wind Watches	32
Do You Know, by W. H. Samelius	35
Horological Guild of Spokane, by Harold C. Kelly	37
Master Watchmakers Association of Colorado	39
Wisconsin Watchmakers' Association	39
Books	40

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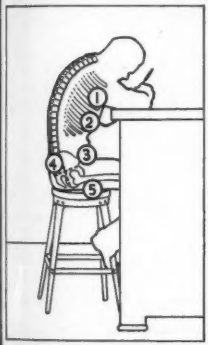

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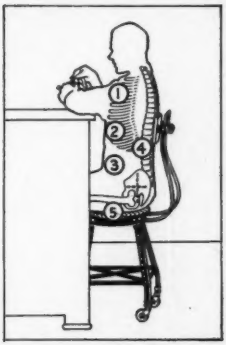

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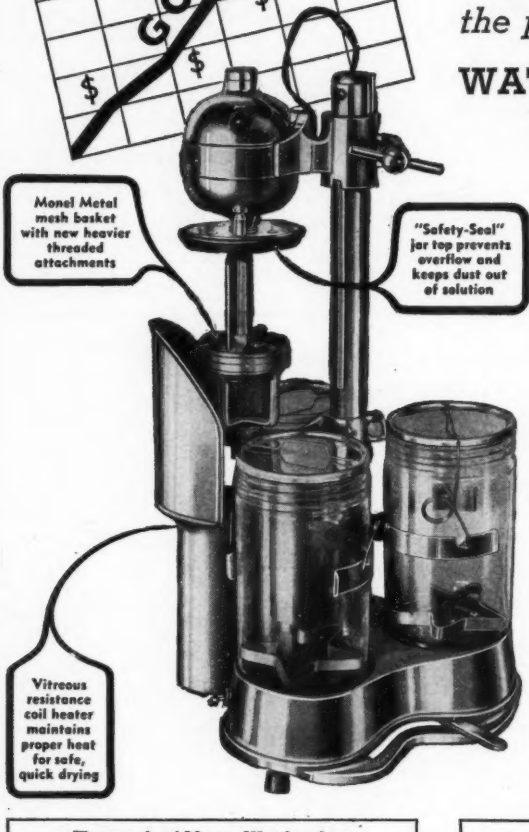
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Co-Operation

By D. L. THOMPSON

Member U. H. A. A. Technical Board

D. L. Thompson

In a previous article in this magazine we stressed the fact that the United Horological Association of America was not a Union organization, but was constituted for the purpose of uniting all watchmakers into an association through which they could work in harmony for the uplifting of the trade to a high plane and possibly to the status of a profession.

This may possibly have created in the minds of some the impression that we are against Unions in our craft and industry. This, of course, is an erroneous impression as we have no ambition to influence in any way the affiliations of our members in any organizations to which they care to belong.

It is possible that the watchmaker may hold membership in several trade organizations, and many do, but this in no way interferes with our membership in a National Association of Watchmakers, the United Horological Association of America, which is an Association operating with the objectives of bringing together all watchmakers regardless of their affiliations, into the Association for their mutual benefit in the way of creating a spirit of good fellowship, mutual co-operation in raising the ethical standards and encouraging and inculcating a high degree of proficiency in our work.

Progress means change and conditions under which the watchmaker works today differs somewhat from that of the past. The apprenticeship system, which in the past was the means by which a young man obtained an education in horology, has fallen into decay due to economic conditions.

The employer of today is reluctant to take an apprentice and pay him while he is learning but rather expects and receives a fee for such training which naturally shortens the time the student is willing to spend in learning the trade with the inevitable result that many are turned out with only a superficial training.

There is little possibility that there can be a return to the old apprenticeship system so the student must look to the Horological Schools for his training and to the student with sufficient means, this affords a splendid opportunity to receive a thorough education in horology. The number of students having the means to attend one of these schools is limited, and this brings us face to face with the disturbing fact that there are many watchmakers employed in the trade today who have but a superficial training through no fault of their own but due entirely to conditions as outlined above.

What to do about this? The answer seems to be that an Association such as the United Horological Association must step in and through the co-operation of our skilled members, set to work on an educational program operating through the Guilds of America to begin where the instructors of these men, whether in shops or schools, left off and instill a desire in them to become finished workmen. No one is too old to learn and one often learns much from a student through the stimulation one receives from an enquiring mind.

This sort of work has been started in earnest in many Guilds all over the country, and it has been a great stimulus to our interest in our time-honored profession which interest had lagged to the extent that there was a general feeling of distrust of our fellow watchmaker and an almost total disregard of his interests, but now we are realizing that whatever is in the interest of one watchmaker is in the interest of all and the spirit of antagonism has given way to a spirit of co-operation the beneficial effect of which extends to all those par-

ticipating and even to those who are reluctant to enter into this spirit.

Down deep in the heart of every man there is a desire to be helpful to his fellowman. Economic conditions sometimes tend to sidetrack this desire through creating an indefinable and unreasoning fear of his competitor. This illusion comes from the thought that in some way our competitor may hurt us. This has led to vicious practices by some to the hurt of the profession in general. Happily most of us realize that nothing is to be gained by such dissention and a feeling of mutual co-operation and helpfulness is being displayed which will bind us together and release the economic pressure which causes these vagaries.

Every man has principles and ideals and will fight for them. Individually he may make little progress but in association with men of like principles and ideals, and I think we watchmakers are cast from the same mold, he can cause these principles and ideals to prevail in his trade.

Let's not quarrel with our brother, who through economic stress is lowering the profession by offering his services at ridiculously low prices, but induce him to join with us to eliminate such practices for the benefit of all. Some stores are using this low price bait not realizing that the public is intelligent and can see through it and know that good work cannot be done for so little money and that there must be a catch in it somewhere. The thought sticks in the public mind that we are of a low order of intelligence or that our honesty must be questioned. This sort of thing can be discouraged by our members through a determined and quiet campaign of brotherly discussion of its harmful effects.

The several states will solve the above difficulty through the passing of licensing and regulatory laws which set a high standard of ethical practices. This will be of incalculable benefit to watchmakers and the general public in these states and these benefits must be extended to cover all states. We have much work to do before we may expect the fulfillment of this result and must not rest on our oars until it is accomplished.

With a live state association in each state and all affiliated with the United Horological Association, we can accomplish this quickly and go on with our educational and fraternal work, build a horological institute with endowment funds gathered from public spirited persons all over our great country and establish our craft as a revered profession extending it to cover many scientific instruments for use in war and in peace.

To those brothers in the craft who are members, or who may wish to become members, of a Local Union of Watchmakers, may we say that you need have no fear of us as our work and aspirations do not conflict with your interests in any way and that we have only the desire for your co-operation in our work for the benefit of all engaged in our craft.

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The Oil Question

By GEORGE T. GRUEN

Member U. H. A. A. Technical Board

The problem of the proper oiling of watch movements is one of the most important and most difficult to determine. Two things must be considered:

1. The quality of the oil to be used.
2. The technical properties that the movement has to have to retain this oil.

The latest chemical research and experiments have proven that all the various companies manufacture good watch oils.

However, great differences were observed according to the quality of the movements, as various factors must be taken into account in order to insure that a watch is properly oiled, such as:

1. The quality of the hole jewel.
2. The shape of the hole jewel.
3. The diameter of the hole jewel.
4. The setting of the hole jewel.
5. The diameter of the cap jewel.
6. The space between the hole jewel and the cap jewel.

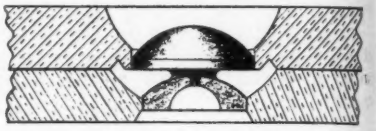
In a good watch, ruby jewels of the best quality should always be used for the balance hole jewel. The jewel should be bombe (curved) so that it responds to the laws of capillary action; it should have the largest diameter possible to prevent the escape of the oil; it must not be simply pushed in, but also large countersinkings should be made to increase the space used by the oil. The cap jewel also should be of ruby and of a larger diameter than the hole jewel, with a groove to prevent the oil from spreading. The space between the hole jewel and the cap jewel should be rigidly held from 0 to 3 hundreds of a millimeter. All these conditions will naturally increase the price of the watch, but the final result obtained is well worth the difference.

The cheap watch of inferior quality has the following characteristics:

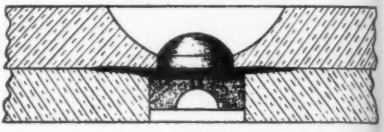
1. Balance hole jewel of garnet.
2. Hole jewel flat, of small diameter, pushed in and without countersinkings.
3. Space between hole jewel and cap jewel varies from 0 to 6 hundreths of a millimeter.

Summing it up, a movement having the required technical conditions for proper oiling, will always give satisfaction regardless of the type of oil used with the understanding that the oil employed is of the best quality.

A GOOD WATCH



A CHEAP WATCH



On the other hand, a movement of cheap quality, with the aforementioned technical defects, will never properly hold the oil, even though the oil used is of the best.

TOOTHPICKS

One of our good members, Mr. H. A. Goudy of Canton, Kansas, has forwarded a suggestion that we feel worthy of passing on to the trade.

Mr. Goudy states he has been using the round Diamond Brand toothpicks in place of pegwood. These toothpicks are made of hard wood, are readily pointed with a sharp knife and are convenient to handle, especially on small watches and are inexpensive.

Folks who sit down and waste life's golden moments will miss the silver lining.—*Los Angeles Times.*

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The Staking Tool

VOLUMES have been written on the watchmakers' lathe and its use, while the staking tool—next in importance to the lathe—has received but scant notice. There exists real need of articles on the staking tool; to, in a measure, supply this need is the chief object of this work. We trust that it may prove helpful to many.

In describing some of the uses of the staking tool, we have introduced certain small special tools, which greatly facilitate the work.

To do work *quickly* and *well,* is *important* to the modern watchmaker—if he would *succeed.*—F. R. C.

First Principles

The staking tool is comparatively simple, and very simple to use; yet, there are *wrong ways* to use even simple tools. Note the cut, Fig. 1, which shows how a punch should be held *in all riveting operations,* hole-closing, and all work requiring a heavy blow.

Fig. 1

As shown, the finger and thumb rest on or over the top of the staking tool, lightly grasping it, and also the punch; a slight *downward* pressure should be exerted on the punch.

By this method there is no rebound of the punch when struck; while striking a *free* punch often results in injury to the work.

As we all know, steel is a resilient material; under impact—like the blow of a hammer—a punch suddenly shortens, and as suddenly recovers; the sudden return to normal dimensions is what causes the rebound, when the punch is left free.

It is also worthy of note that the greater the inertia of the anvil—in other words, the heavier and more unyielding it is—the greater is the rebound.

As a homely illustration, throw a ball against a brick wall, and then against a light wooden one, and note the difference in the rebound.

In some exceedingly light work, such, for example, as closing a light fork, or flattening a small drill, it is not so essential to hold the punch.

As to Fitting of Dies

Some watchmakers imagine that a staking tool die should have absolutely *no shake* on the frame, when *not bound.* To make staking tools to meet such requirements would necessitate *grinding every hole to size,* and circle, after the die was *hardened, thus greatly increasing the cost,* and *adding nothing* to its value.

The conditions required are: every hole should center properly with the set punch, and when the die is *bound,* the hole should *remain* accurately in position.

Don'ts

If you would have the holes in your staking tool die remain in *good condition,* sharp and smooth for fine work on watches, don't punch main springs on it. If you wish to punch main springs or do similar work, make a stump with hole of the required size; this, when dulled or damaged, can easily be repaired.

Closing Holes

In a general way, the methods of closing holes may be divided into two classes: that by which the metal is upset and condensed, and that by which the metal is gathered in and condensed—as by a taper mouth hollow punch. Each method is best suited to particular cases, for example: with small holes, the first

method is best; with large holes, the latter method.

Closing train pivot holes in watches having a low number of jewels, is a job that comes almost daily to the watchmaker; and often many times daily.

There are some workmen who eschew closing pivot holes, and insist on bushing in every instance. Every one has the right, certainly, to decide what course he will pursue; but is it not wiser to exercise discrimination and judgment in *each* case, than to sweepingly denounce, just because a method would be botch-work if followed in *some* cases.

It is a fact that many holes are closed that should have been bushed; so let us try to confine ourselves to the consideration of cases that we may safely call legitimate; holes slightly worn, or originally too large, for example.

Every watchmaker understands that correctly fitting pivot holes are very important if a watch is to run even moderately well. In the first place, holes too large result in *loss* of power, and in addition to this, it makes the power that is transmitted, variable in amount. Therefore, it is a poor policy to put in a stronger mainspring to bring the vibrations of the balance to the required ampiltude; we will be building reputation by doing it right in the first place, and generally we save time as well.

Being methodical watchmakers, we observe the nature and extent of the necessary repairs before taking the watch down. When closing of holes is called for, we carefully note the end shakes, and change them if necessary, when we close the hole.

It will be understood that we are considering the closing of holes in watches only. Methods are practiced in the repairing of cheap clocks, which we would not tolerate in watches—even cheap ones. Moreover, the Staking Tool is not generally used in closing holes in clocks; every workman recognizing that less artistic work is required. In practical work, we frequently have to modify the old adage "whatever is worth doing, is worth doing well" to, whatever we do, we will do *well enough*. This means that we will do each job as well as the general quality of the watch requires—we will preserve the harmonious character of the machine.

Having examined our watch, and found that several holes require closing, we proceed as follows: first peg out the holes; this may save imbedding grit or metallic oxide in the metal, which would subsequently cut the pivot; at any rate it's a safe precaution.

Fig. 1 shows in section—through a pivot hole—a part of a watch plate. This shows a pivot hole as it *should be*, not as it often *is*, even in new watches.

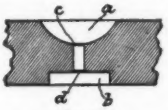

Fig. 1

We usually find a considerable burr at *c*, around the upper end of the hole. This interferes materially with the proper supply of oil to the pivot, and should not be tolerated; let no burr be left on the holes *we* close.

We select a round faced punch, of slightly smaller radius than the concave sink *a*—this allows it to touch the bottom of the sink *a*, immediately around the hole—see Fig. 2, and a flat-faced stump which will freely enter the recess *b*, of Fig. 1. The depth of the recess *b*, varies with different cases, and frequently there is none at all; but where there is one, it is essential that the stump should enter freely. Placing the stump in the Staking Tool, we hold the plate in position with the recess *b*, on the stump, and bring down the round-faced punch to enter the concave *a;* Fig. 2 shows the conditions. Then by grasping the punch with the fingers, above the top of the tool, and pressing downward we hold the plate in position, and practically horizontal; when a blow on the upper end of the punch with the hammer condenses the metal between the punch and stump;

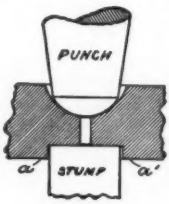

Fig. 2

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as the hole offers the path of least resistance, most of the displaced metal goes into it.

This process shortens the hole somewhat; but the final result, when properly done, is a bearing at least equal to the original. Our next step is to open the hole to properly fit the pivot; this we do with a round broach, oiled. We should avoid closing the hole in the first instance, beyond what is really necessary to form a good bearing the full length of the pivot; for if we do, we unnecessarily shorten the hole, and make extra labor—both are losses that should be avoided.

The action of the round broach in opening the hole invariably throws up a burr at the ends of the hole, which should be removed. To remove it we need a special countersink or chamfering tool. Such a tool is shown in Fig. 3, and is made of a piece of steel wire about 1.5 mm. in dimeter, with the end turned to about the angle shown, when it is

Fig. 3

hardened and tempered to a straw color; the pointed end should be polished; then we grind away almost half the diameter, as shown by dotted line; this surface need not be polished, though it should be ground *smooth* on a fine Arkansas or Jasper stone. It should be fitted to a light taper pegwood handle, although if one wishes he may have something nicer than pegwood for a handle, such as ebony or rosewood, or aluminum, but a good round piece of pegwood, tapered as shown, leaves nothing to be desired in the way of convenience. An hexagonal piece applied as shown at *a* and *b*, the latter being an end view, makes the tool easier to pick up, and prevents rolling.

After we have opened the hole with the round broach, a light application of the chamfering tool we have just described, will remove the burr, leaving the ends of the hole in perfect condition; if we choose, we may lightly insert and turn the round broach again after using the chamfering tool, but it will rarely be necessary.

The broaches one is generally able to buy in the market are not very satisfactory; it will pay us to fix them up before attempting to use them. We select a pentagonal or cutting broach of the required size, and fixing it firmly in a light pin vise, or broach holder, we lay it on a flat piece of cork or fungus, or a piece of soft pine, held in a vise, and with an India oil stone slip, grind the five sides flat and bring the angles up nice and sharp. The finishing strokes should be lengthwise the broach, which gives it much smoother cutting qualities.

Then we select a "round" broach, so-called, for they are never really round, as nearly perfect as possible, and grasping the shank in a lathe, we grind it practically true, in taper and roundness. This is easily done by holding a flat piece of cork under the broach as it revolves, and the oilstone slip is held over it; not pressed closely down, but allowing the oilstone to rest upon the cork back of the broach, the two forming an acute angle; the space is then narrowed, until the stone just touches the high spots on the broach as it revolves; this process soon brings it practically true.

This leaves the lines running *around* the broach; we want them to run lengthwise; we do this by rubbing the broach lengthwise, while held on a smooth piece of soft wood, with an emery buff of suitable grade. By using a rather coarse emery buff a considerable degree of cut can be given to a round broach, when used in soft metals like brass or German silver.

Our round and cutting broaches should be fitted with a light, straight wood handle, such as a piece of pegwood.

If we have a suitable box to contain our pivot hole tools, and label it so we will recognize it easily, and always keep the tools in it when not in use, we will find it a great saving of time. The tools are always together, and we are able at all times to put our hand right upon

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them; *system* is a great thing for any workman to tie to; he turns off his work rapidly, saves lots of nervous energy, and often economizes greatly on the swear words.

The hole, as we have closed and finished it, will be about as near perfection as a metal hole can be; the slight chamfers we have made at the ends serve to hold the oil around the pivot, even to the last particle. In opening the hole with the round broach, we must take pains to maintain the broach upright; if we fail to do this, the pivot may pinch in the hole when we set the watch up.

In case we find on our preliminary examination that the end shake should be lessened, we should close the hole just as we did in the first instance; then using a large flat-faced stump to support the plate on the surface *a, a'*, Fig. 2, with a blow on the punch, we drive the metal downward. It is generally wise to use the small flat-faced stump again after this, to harden the metal and flatten the surface around the hole. The hole is then opened and finished in the usual way.

If the punch used in closing is highly polished, the oil sink around the hole will be smooth, and hardly need any polishing; it will be more than equal to the original hole, as they are left in most American watches.

The business end of all regular punches are highly polished—by "regular" is meant all the highest grade tools, as distinguished from the "Specials."

In case it is required to polish the oil sink after closing, it is easily done by means of a soft pine stick and rouge, or almost any polishing powder.

To return again to the matter of punches; it will be found that all round-faced punches are less rounded than we have recommended; it will be worth while for the watchmaker to re-shape and re-finish all his smaller round-face punches, up to about No. 40 Stubs' gage, to conform to the rounding shown in Fig. 2. Henceforth, all the round-faced punches of these sizes will be made in this way.

Before leaving the subject of closing pivot holes, we will describe a device for the ambitious workman, who has time, or finds time, to make a few special tools, that save on the job many times over what it costs to make them.

In the opening of holes as usually practiced, considerable time is spent in finding suitable broaches, in the first place, then in the repeated trials of the pivot in the hole.

The device here shown enables us to open the hole the first time to the correct size. We first prepare a round

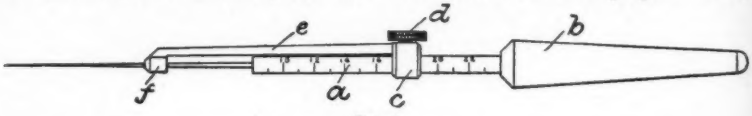

Fig. 4

broach, as we have already described, grinding it to as true a taper as possible; we finish it by lengthwise grinding, as though we were to use it as a round broach.

We now convert it into a cutting broach, by grinding away slightly less than half the diameter; about 45-100 of the diameter will be found to give good results. This flattened side should also be ground to leave the lines running lengthwise, and all burr carefully removed. This broach will produce very round, smooth holes.

Our next step is to provide a suitable stop, which may be set at any point on the broach; the arrangement is shown in Fig. 4. It consists of a steel, brass, or German silver rod *a*, of about 2 mm. diameter, fitted to a neat, light taper handle, *b;* the exposed part of *a* should be equal in length to our broach, or slightly more. The broach is fixed securely in the outer end of *a;* the whole thing should be true when rotated.

We now have the part *c*, a neat sliding fit on *a*, capable of being tightened at any point by the knurled screw *d*. From the part *c*, an arm *e* projects, car-

rying at its outer end a light steel tube *f*, having an inner diameter slightly greater than the broach at its largest part. When the part *c*, is close against the handle, the inner end of the steel tube *f*, should just clear the end of *a*.

For our own part, we prefer *e*, and *f*, to be of tempered steel; *c*, *e*, and *f*, being fastened together with hard solder, and afterward hardened and tempered, then ground to our liking. Of course each workman may follow his own methods, in this respect; some will use soft solder, and "get there just the same." Whatever method we adopt, let us give the device that finished look, as though made by machinery, and highly skilled workmen, and not painfully gnawed out by mice.

Now to make use of the device; we measure the pivot, then adjust the end of *f* to a point on the broach, measuring the same as the pivot. Now if the hole has been closed, all we do is to run the broach in until stopped by *f* when the hole should be of the same diameter as the pivot. To have the hole as nearly straight as possible, the broach should be inserted from both sides.

Now the final burnishing by a suitable round broach should give the required freedom. What is still better is to have a *round* broach also, fitted up in the manner described; for in many cases of hole closing the round broach *only* should be used to open.

It is obvious that the rod *a*, may be graduated to correspond with our gage; then upon measuring the pivot, the broaching device may be instantly set to the required size.

It will be seen that this device is nothing more than a slight variation on the taper needle jewel gage; but that does not detract from its practical value. Another advantage of having a round broach fitted up like this, is besides a great saving of time on ordinary opening jobs, is the fact that we may give a known amount of freedom to any pivot,

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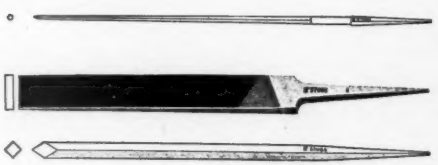

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thus eliminating the element of "guess work" entirely.

A neater design of the micrometer broach would be to make *a* of steel, and arrange the broach to slide within it; in this way we would utilize the end of *a* as the stop, to limit the distance to which the broach might be inserted. Such construction would be more difficult, however, and we would advise the workman to try one as shown, first; then make any improvement he sees fit.

Closing Larger Holes

The closing of holes in main spring barrels and the like is a different problem. Some workmen close, or attempt to close, such holes with round faced punches; the result is never satisfactory. Fig. 5 shows in section the arbor hole of an ordinary main spring barrel. The boss which surrounds the hole, rising above the level of the bottom of the barrel, varies considerably in shape and thickness in different barrels, but in any case there is nothing to prevent making the boss of the shape shown in Fig. 5, which may be very quickly done with a hand graver while the barrel is held in a wheel chuck in the lathe. We then select a hollow taper mouth punch which will go over the boss, and down to about the point shown in Fig. 6, and with the barrel on the large flat faced stump, a good blow on the punch closes in the boss, and also the hole, not only at the small end of boss, but throughout the length of the hole.

Fig. 5

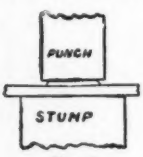

Fig. 6

In case we have to reduce the boss, it is well to make it of a taper to conform to our taper mouth punch; the nearer the taper of the boss conforms to the taper of the punch, the more uniform will be the closing of the hole, throughout its length.

Now if the wear was only *slight,* the closed hole may be opened up with a round broach; the burrs nicely removed, and the barrel should be found to run practically true, and satisfactory. But if the hole is much worn, the barrel should be chucked in the lathe, and the closed hole trued up; it is preferable to true the hole in the cover last. While we have been speaking of closing the hole in the barrel only, of course the same applies to the cover.

There's a reason why the barrel should be trued in the lathe if the hole is much worn; mainspring barrel holes never wear central, for the reason that the pressure on the arbor varies greatly with the position of the outer end of the mainspring, as the barrel revolves. When the end of the spring is directly between the center pinion and the barrel arbor, the pressure is but a small part of the pull of the mainspring; but when the arbor is directly between the end of the spring and the pinion, in other words, when the barrel has made half a revolution from its first named position, the pressure on the arbor is about twice the pull of

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the spring. This causes a very unequal wearing of the hole.

In some American watches, which were so poorly designed as to require an abnormally stiff spring, the cover boss is very short; in many cases so short as to make it difficult, if not impossible, to close the hole as we have described; in such cases we may either bush the hole, or resort to the round-faced punch, which still further shortens the already too short hole.

The better way would be to shorten the hub of the barrel arbor, to allow a cover bearing of sufficient length, and bush the hole to conform. It is never necessary to have the width of the arbor hub for the spring to wind on more than one third the width of the spring. Often in American watches we see the arbor hub chamfered off on each side, making the face no more than one third the width of the mainspring, yet with bearings very thin; the chamfering is an absolute waste of space which should have been devoted to longer barrel bearings.

In opening comparatively large holes, like those of a barrel, it will be found of advantage to insert a narrow strip of paper beside the round broach; it produces very much smoother work than when done without, besides the hole will be straight; this is because the paper yields, allowing the broach to lie closely to the wall of the hole; the conditions are shown in Fig. 7, where the taper of the broach is much exaggerated for clearness.

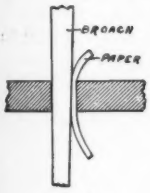

Fig. 7

A narrow shaving of soft wood answers as well as paper; in fact, any substance of a character similar to wood or paper may be used. The same idea may be made use of to open a hole straight with a taper cutting broach. If the hole is straight to begin with, it may easily be opened, and remain straight; the tendency is to preserve the original form of the hole, whether straight or taper.

Closing Hand Sockets

The sockets of hour hands may usually be closed within certain limits, in the same manner we closed the barrel hole; shown in Fig. 6. There will be this difference, however; the hand socket will be closed at the end only, and it should, therefore, be closed somewhat more than desired, and then opened up by filing, grinding, or turning, to properly fit the pipe of the hour wheel. Minute hand sockets are closed in various ways, depending largely on conditions. If the hand has a brass bushing, projecting considerably on one or both sides, it may be closed with a taper mouth hollow punch. If it is an all steel socket, or does not project at all, the round face punch serves best. Second hand pipes are sometimes closed with a small taper mouth punch, or by forcing the socket into one of the chamfer mouth holes in the staking tool die; this closes the socket at the end only, which is likely to produce a wabbly fit. A generally more satisfactory way to insert a cutting broach in the socket and indent its side, just as we do in frictioning a cannon pinion; if the closing needed is but slight, better insert a round broach instead of a cutting broach.

To perform this operation, we will need to lay the socket on the crotch stump, to one side of the notch; or we may use a flat-face stump. The reason we cannot use the notch is, that it would be too deep for most sockets. We have sometimes used the notch, and a small round-face punch to do the indenting; the result is satisfactory.

But for tightening a second hand, an old pair of cutting pliers with the jaws ground rounding, is much more quickly used than the staking tool, and the result is quite as good. Some watchmakers close second hand sockets by pinching them in a wire chuck. This method closes them very nicely, if one cares to use his chucks for such a purpose.

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A Watch

Oh, whether the watch be a costly thing
Or one of the dollar kind,
It matters not if its clicking spring
Is one that a child may wind.
There are just two tasks for a watch to do:
Keep time through the busy year
And then when the work of a busy day is through
To tick at a youngster's ear.

Some crave the watch with the costly case
And some with a rare design,
But give me the watch I may freely place
In tinier hands than mine.
Yes, give me the watch that a little boy
May climb on my knee to see,
And claim from its ticking the thrill of joy
I knew at my father's knee.

Thick and heavy the silver case
Which closed with a hearty snap.
But never a watch could take its place
As I clambered to his lap,
And never a watch shall mean so much,
Though it be of the costliest kind,
As that which my father let me touch
And taught me how to wind.

So I hold that a watch has a two-fold plan
And a double task to do:
It must mark the minutes which pass for man,
And then when the day is through
It must swing on its chain for the girl or boy
Who chooses to climb his knee,
And give to the youngster the golden joy
Of its glorious mystery.

—EDGAR A. GUEST.

Radium-Dialed Watch

If you own a radium-dialed watch with luminous dial and hands then you are the possessor of a vast power plant of no mean proportions, says the Electrical Experimenter. There is sufficient radium on your watch dial to haul your train homeward, if it could be properly applied. As the matter stands, the innocent-looking radium dial does not seem to possess any extraordinary amount of concentrated energy, but this is only apparently the case, and not actually so; for the reason that while the amount of activity manifested by the radium paint on the dial is small, this effect will keep up for 2,500 years, provided the zinc sulphide, with which the radium is mixed so as to produce a glow, held out that long. The zinc sulphide in most cases gives out in about eight or ten years.

Now, if we could but find a way to make the radium release all of its energy in a few hours instead of spreading it over 2,500 years, it would not be difficult to make a motor that would utilize this energy.

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Mainsprings and Position Rates

By Jos. A. Biemel

ANY repairman wishing to have any degree of success in adjusting watches to positions, must not overlook the fact that a good quality mainspring contributes largely in correcting position errors. A mainspring that is somewhat set or one of a poor quality of steel having little elastic reaction, cannot produce the best of position rates, even though all other minor adjustments are made to correct the position errors. Even the ordinary watch not marked "Adjusted to positions," can be greatly improved by changing the mainspring to one of good elastic reaction. All watches should be checked to positions whether so marked or not. Minor faults are easily overlooked especially when one does repairing as well as waiting on the trade.

A few examples taken from my note book will show the differences in position rates before and after changing the mainspring. These watches were put in good order and all minor adjustments made, so that no factor could affect the change in positions.

The first, a 7-Jewel, 16-size Elgin. In this case it was noticeable that the balance arc was somewhat sluggish at the end of 24 hours, which would be traced to the mainspring as a cause. But it was tested in order to show just about how much difference this would make. The first test is shown on record card marked: Job 7019. The result of the first test is shown in the second column, and after changing the mainspring which was quite set to one of good elastic reaction, the results were as per fourth column. This result was quite unusual for a seven jewel watch. A difference of only three seconds in the extremes.

JOB 7019							
Make 16S. 7J. Elgin							
DU	+ 4	+ 4	+ 5	+ 5			
DD	+ 8	+ 4	+10	+ 5			
PU	—41	—49	+12	+ 2			
		53		3			

JOB 272							
Make 12S. 17J. Howard							
DU	+ 6	+ 6	+ 4	+ 4			
DD	+ 8	+ 2	+ 5	+ 1			
PU	—25	—33	+ 5	0			
		39		4			

JOB 314							
Make 16S. 17J. Rockford							
DU	+ 3	+ 3	— 2	— 2			
DD	+ 5	+ 2	+ 2	+ 4			
PU	—15	—20	+ 4	+ 2			
		23		6			

The second, a 17-jewel, 12-size Howard. After cleaning and making repairs and minor adjustments without disturbing the mainspring, the three position test is shown on card marked: Job 272. The second column shows the results of the first test. After changing to a better quality mainspring, the second test was as shown in the fourth column.

The third was a 17-jewel, 16-size Rockford. Put in good order, the first results of the three position test are shown on card marked: Job 314, column 2. After changing to a better quality mainspring, the results were as in column 4.

The foregoing does not go to prove that a good mainspring in a watch is all that is necessary to make it keep time in all positions. But it will show that if you have put your watch in good order and tested it to positions without using a good mainspring, it will not give you the best position rate. A good mainspring in your watch will also insure better time-keeping throughout the year.

Astronomic Watch

An astronomic watch which combines a very unusual number of indications is the product of S. Smith & Sons, Trafalgar Square, London. The front main dial of the watch, on which ordinary time is indicated, carries four small dials. One of these shows the days of the week and the date of the month, while another shows a perpetual calendar indicating, first, second, third, and leap year. The third small dial indicates the phase of the moon, and in connection with this dial there is an indicator and pointer which shows at any time to what extent the watch may be wound up. The fourth small dial acts as a recording chronograph and shows the hours and minutes, seconds and fifths of seconds being recorded by a pointer operating over a dial engraved round the outer circumference of the main dial in the way that will be generally familiar. A stop arrangement operates in conection with this chronograph mechanism, and both the second hand and the hour and minute hands of the main dial may be returned to zero at any time.

The main dial also carries a further hand which is rendered distinctive by a small sun near its outer end. This hand shows the equation of time, or the position of the sun before or after clock time. The sun and the clock agree on December 25. On December 27 the sun is 59 seconds slow as compared with clock time, while on December 28 it is 1 minute 29 seconds slow. By April 16 it agrees again, and on April 17 is 19 seconds fast, and so on. Sun time and clock time agree on December 25, April 16, June 14, and August 31. The coincidences vary slightly in different years. These variation are allowed for by the watch itself, as also are the variations in the number of days in the month and the special February variation in leap year. The watch strikes hours and quarters, and repeats hours, quarters, and minutes at any time at will.

On the back of the watch there is a dial showing the sidereal days of 24 hours. This is the time that elapses between two successive upper culminations of a fixed star. It is shorter than a mean solar day by 3 minutes 55.91 seconds, so that the sidereal hour hand actually takes 23 hours, 56 minutes, and 4.09 seconds to travel around the dial. The back of the watch also carries a star chart or planisphere. The point on the chart corresponding to the north pole is set at the center of the sidereal hands, and the exposed portion of the chart corresponds with the portion of the sky visible in the latitude at which the watch is used. Arrangments are made to set the chart to fulfill this condition. The chart is geared to the sidereal time movement, and the times of the rising and setting of the stars are duly indicated. The chart is of assistance in obtaining the bearing of compass points. The movements of the watch are built in three galleries or tiers, and are fitted throughout with diamond and ruby jewels. A 60-second revolving escapement is used which reduces the positional error to a minimum. The watch runs for 30 hours with one winding. It has an 18-carat gold case, and is certainly a very remarkable example of the watchmaker's art. We understand it was constructed to order and cost $5,000.

—From Engineering.

It was an amateur, David Rittenhouse, Philadelphia watchmaker, who was the pioneer American astronomer.

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S-117—Clearly shows the name of the maker, Estienne Ester, of Geneva. The balance cock is of silver, also the ratchet-click. Middle 17th Century.

S-118—22-kt. gold cased watch; white enameled dial; steel cut hands.

S-119—Shows the beautiful hand engraved and cut balance cock and regulator guides and small diamond end stone with steel setting. Verge escapement; chain and fusee drive. This watch bears the engraved signature of Greoge Graham, of London, one of England's foremost horologists. He was born in 1673, died in 1751 and is buried in Westminster Abbey.

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Making Laps for Pivot Polisher

By HAROLD C. KELLY
Member National Technical Board, U. H. A. of A.

Harold C. Kelly

The balance pivots should be round, cylindrical and well polished. This may seem to be a self-evident statement yet the common practice of holding a grinding or polishing slip in the hand does not leave the pivot round and seldom cylindrical. The work should be done by either of two methods—the Jacot lathe or pivot polisher. The writer's opinion is that the pivot polisher is to be preferred. However the successful use of the pivot polisher depends largely on the proper preparation of the laps and it is the purpose of this paper to consider their proper preparation.

Figure 1

The horologist should make his own laps. The taper chuck shown in Figure 1 is required for the purpose. This may be made from an arbor intended for holding grinding wheels such as supplied by material houses. All that is necessary to make chuck is to turn a taper exactly corresponding to that of polisher spindle by means of slide rest.

Material for laps may be purchased from material houses and hardware stores. We need laps of brass, bell metal, cast iron, boxwood, tin and copper. Laps of ivory and tortoise shell are found convenient for special work. We shall now consider the making of the several kinds of laps.

Brass, Bell Metal and Cast Iron Laps —Laps made of brass, bell metal or iron are used principally for grinding. The material may be purchased from hardware stores in rods of various diameters. For most needs of the horologist, rods of about 5/8 inch diameter will suffice. Having selected the material desired, saw off a piece about a half inch long and bore a hole in it of nearly the required size. The hole is reamed out with a reamer of the correct taper (Figure 2) and the blank is placed on the

Figure 2

taper chuck for turning with the slide rest. Laps are needed in various shapes as shown in Figure 3. It is a simple matter to turn the blanks with the aid of the slide rest, therefore no comment is needed in that regard. The more important factor in the preparation of the lap is the filing of the face and side. Herein lies the success or failure of the operator and we shall, therefore, consider the filing, giving careful attention to every detail envolved in the work.

It is understood that the filing is to enable the lap to hold the grinding or polishing powder more readily. Filing, it is admitted, has a tendency to destroy its truth, yet this is necessary in order to do good work. Experience has shown, however, that it is possible to file a lap many times and still run practically true.

Having finished the turning, we file the lap by laying it face down on a Number five or six file. Holding the lap between the thumb and fingers, slide it along against the cutting teeth of the file about an inch or so. The lap should then be turned partly around and another stroke made. This crosses the lines somewhat providing a suitable surface for the embedding of the abrasive medium. Next we prepare the side of the lap. This is done by drawing lap on

Figure 4

the file as shown by the arrow (Figure 4) turning the lap slightly as it is drawn along. Continue in like manner until the entire circumference is filed. It is important that the lap is drawn as stated so as to produce a slight burr at the meeting point of the face and side. This burr is necessary in reducing and polishing square shoulder pivots. With a little practice it will be found that the rounded corner (frequently found and otherwise difficult to cut or grind away) may be entirely removed leaving the pivot cylindrical and the shoulder square.

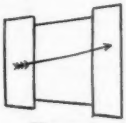

Figure 4

Boxwood Laps — Boxwood laps are used for putting a high polish on steel. Balance pivots are successfully polished by means of boxwood. We may use the slide rest in turning the boxwood in the same manner as we did in preparing the brass, bell metal and iron laps. For balance pivots it is important that the grain of the wood run parallel with the hole in the lap so that the end of the grain touches the pivot to be polished. The lap is filed on the face only using a Number three file.

Tin Laps—Tin is probably the best material obtainable for the polishing of steel. Laps of tin are excellent for putting the finish polish on staffs, in fact, every steel part of a watch may be successfully polished by the use of tin in some form.

Tin tubing may be purchased in various diameters. It is necessary to turn up a brass bushing upon which the tin tubing is forced friction tight. Select a piece of brass ½ inch long, bore a hole and ream to fit taper chuck. Set the slide rest at about one degree taper and turn the brass so as to tightly fit the tin tubing. Remove the brass bushing and saw lengthwise three or four slight grooves. These grooves are for the purpose of holding the tin in place when forced on by means of a small hammer. Otherwise the tin tubing is apt to come loose from the brass bushing. Now having prepared a piece of tin tubing about a half inch long we force it securely on the brass bushing. Replace the blank on the taper chuck and turn it to the desired shape. Next file the face of the lap as heretofore described. Being rather difficult to file the side of a tin lap by holding it in the hand, we get around this difficulty by placing lap on taper chuck. Running the lathe slowly, the cross filing is satisfactorily done by moving a file back and forth, applying a gentle pressure to the side of the lap.

Copper Laps—Copper laps are used to refinish winding wheels, main spring barrels and other parts where raying or graining is desired. Charging the lap with carborundum powder or diamond powder and adjusting the polisher at right angles to the work and a little above the center, a very pleasing effect is produced

Copper tubing is available and the manner of making laps is identical with that of the tin laps described above.

In our next paper we shall consider the preparation of the various kinds of grinding and polishing materials and give also a detailed account on how to use the pivot polisher in order to realize the finest results possible.

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Editor, Arthur Tremayne; Technical Editor, T. R. Robinson. World wide subscription one dollar yearly postfree. N. A. G. Press, Ltd., 26, Old Street, London, E. C. 1, England.

Freeport Watch Company

By HAROLD J. FRISBIE

Courtesy of Mr. G. L. Munn, Freeport, Illinois

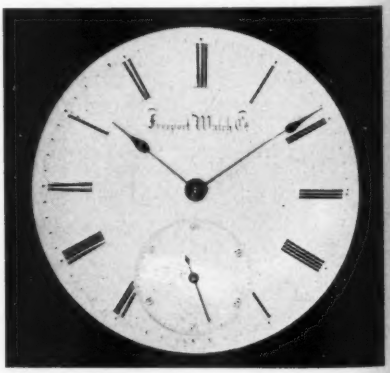
THE organization of the Freeport Watch Company took place at Freeport during the years of 1873-74. The factory was built and the manufacture of waches was started. It was in operation only a few months. The authorized capital was $250,000, most of which was raised in Freeport. There were a few people from out of town who were interested in the factory. The officers of this company were: C. J. Fry, President; L. K. Scofield, Vice-President; L. L. Munn, Treasurer, and A. A. Griffith, Secretary.

The officers were the largest stockholders in the concern. We have been told that Mr. Griffith was from out of town and that he owned the patents and designs.

From a newspaper article, dated October 27, 1875, relating to the fire which destroyed the factory, it states that some 300 brass movement watches were almost completed, and about 20 nickel movements. The only movements the factory completed were five nickel movements. We can give no information as to the number of people employed.

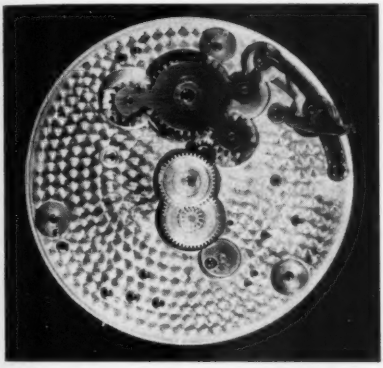
It is stated by elderly people in Freeport, who recall happenings of sixty-two years ago, that the grounds and the building were very beautiful, and they were located just outside the city limits to the south of town. The location is now part of the residential district of Freeport.

After an ardent search for information and one of Freeport's watches, Mr. G. L. Munn, son of the late L. L. Munn, who was treasurer of the Freeport Watch

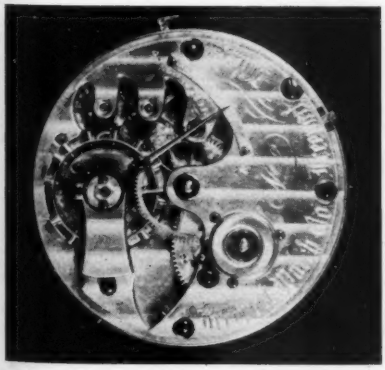


Manufacturing Company, came to our aid and supplied watch No. 2, which is the property of the heirs of the late L. L. Munn.

We will describe the movement as nearly as possible. It is a hunting movement and a trifle larger than an eighteen-size, the plates are nickel, very nicely damaskeened and hand engraved.



It has fifteen jewels, and the jewels for the train wheels and the lever are burnished in the plates. The watch may be used as key wind and key set or stem wind and lever set. The setting mechanism is operated by a lever that is pushed toward the stem to throw the setting mechanism in gear. All screws have round heads and are blue. The train wheels are gold. The escape wheel is steel, the lever is steel, the ecapement is



single roller. The hairspring is breguet, the hairspring has a very clever type of floating stud, the balance is compensated and has large gold screws.

I believe, without exception, this watch has the largest breguet hairspring in any watch of its size. The stop work located on the mainspring barrel, is operated from a pin on the main wheel or winding wheel. The maltese cross is located on the barrel. The ratchet wheel and click are on the upper plate. The watch is also equipped with a safety pinion.

The workmanship is excellent, and the watch was considered among the finest made at that time. It is in perfect condition, and is a good timekeeper today.

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"Watch Us Grow"

Modern Shop Equipment

By D. L. THOMPSON
Member U. H. A. A. Technical Board

WE are living today in an era of fast advancement and if the watchmakers as a group are to keep up with the progress that we see all about us, we must discard our ancient and time-worn ideas and be recipient of the modern thought.

Tools to replace the hand work of the past and speed up our operations are necessary to our advancement just the same as they are in other lines. There has been a noticeable improvement in this respect in many shops where we see the most modern equipment in the way of cleaning machines and timing instruments.

Watchmakers are loath to accept new methods. Why? No one can say, but it is a fact that we cannot deny. It cannot be the cost of these modern machines, because the first cost is spread over such a length of time that their cost is practically nil when charged against the increase in business that can be done with the speed up in our work. For instance, when we compare the difference in time between jobs that we turn out using these modern aids to the jobs that we may turn out using the old methods, we cannot help seeing that the modern way is better from a mechanical as well as commercial standpoint. The problem of come-backs, which eats into our profits, is practically eliminated by the use of these modern aids. Surely the art of watchmaking is hand work primarily and we have reason to be proud of our ability to turn out excellent work by hand and hand work will continue to be a prime requisite but the time-killing work of cleaning and timing of movements can be shortened and improved to such an extent by the use of modern machines made for this purpose that it gives us time for more work and this means an appreciable increase in our income, said income being also a prime requisite in our trade.

Many wachmakers may contend that cleaning cannot be done satisfactorily by the use of machines and many are so set in this opinion that they refuse or neglect to try this faster method. It is a fact, and we must accept it, that cleaning can be done much better by machine than in any other way and in a fraction of the time taken in the old way. To digress a moment we may state that the same attitude was taken at first to the washing machine for the family wash. No one will now deny that the washing machine does a superb job and is much faster than hand washing and few wish to continue in the old way.

The modern watch cleaning machine eliminates many of the cares of the old method and most of the time taken in doing a tedious job. The modern watch cleaning solutions do a perfect job without resorting to the brush, pegwood and sawdust. It is of course necessary to diassemble the movement completely in order to do a good job and it is surely not to be recommended that you do not do this. Certain parts may be left on the plates if the screws are loosened so that the cleaning solution has full access and if the parts are thoroughly dried there will be no corrosion to fear.

It is to be recommended that springs lying close to the plates be removed as there is a possibility that the solution in drying will leave a mark of the spring on the plates. Movements that are rusted or that have oil caked on them should be attended to before placing in the machine.

Some may think that tangling of the hair spring and balance would be common when using the machine. This is not the case as the balance with the hairspring in place may be put in a special compartment in the basket and may be cleaned much better than possible by hand considering the short time required.

(Continued on Page 33)

Connecticut Clock Factory

We have received a letter from Mrs. T. A. Dorgan, wife of the late cartoonist, TAD, in which she enclosed the picture reproduced here and requests information as to what factory it represents.

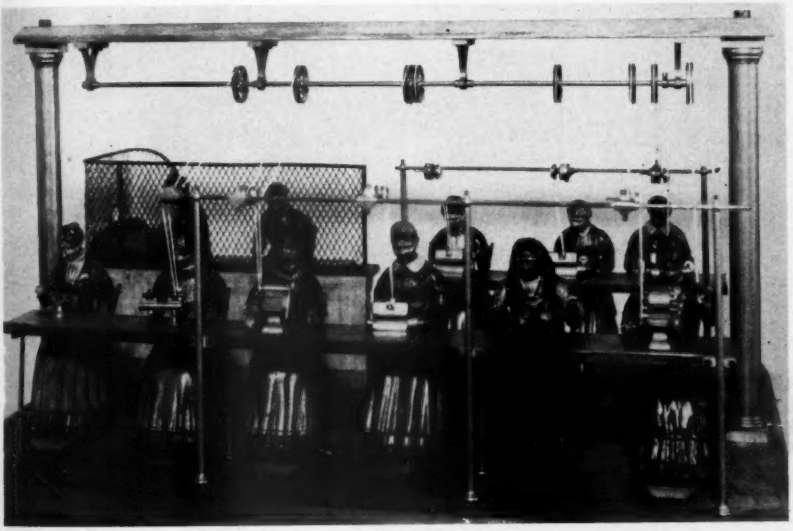
If any of our readers can identify this picture we would very much appreciate hearing from them.

I am anxious to identify the factory represented.

My husband was TAD, the cartoonist, and my experience has taught me that, "when in doubt, consult the third estate."

Sincerely,

MRS. T. A. DORGAN.



The letter follows:

To the Editor:

The photograph I am sending you is a portrait study of the interior of a Connecticut Clock Factory. The figures are beautifully carved and colored and each has limited movement of one arm. The tiny lathes, etc., are beautifully executed, and the whole is intended to be run by a belt arrangement conected up outside of the platform which contains the various parts controlling the movement.

The costumes are of 1860.

The photo does not do justice to the group. The ladies are perched on stools. The cashier counts money. The bookkeeper is apparently writing.

Time Hill, Switzerland

Mr. George T. Gruen, member of U. H. A. of A. Technical Advisory Board, returns to Switzerland after six years' absence, to look after the technical horological work in connection with the manufacture of the Gruen watch products, and will remain in Switzerland for the balance of the year in this capacity.

While in Switzerland, Mr. Gruen's interest in the U. H. A. of A. and THE AMERICAN HOROLOGIST does not wane, due to the distance separating him from the organization, in which he is so active and interested, and continues to forward materials of interest for the readers and members of our National Publication and Organization.

Moral Responsibility of the Man at the Bench

By J. P. Sommer

Member U. H. A. A. Executive Board

J. P. Sommer

Did it ever occur to you as you sit working at your bench, what you are working for?

What are you doing for $1, $1.50, $2, $3, $5?

How you exhaust your nerves, your eyesight, your health, sitting as you do in a hunched position all day.

Have you ever had to pay for an operation? For an hour's work the doctors say, $150 and up.

If you are fortunate enough to own an automobile, when it needs repairs, the garage-man says, $9 for parts, $27 for labor, and you pay by the hunched sweat of your brow, for a little pleasure.

The banker, and who is he? But if you want a small checking account, says, pay me a service charge, it costs money to handle small change, so pay me.

Who are these fellows? Just human beings like yourself.

Ah, but there is a difference, they have behind them organizations, whereby they are paid well for what they do. And that organization does make a difference.

Does your wife and children have all the necessities of life to which they are entitled, and which some other type of craftsmen or professional man can give his family, that you cannot afford to give yours?

If you are satisfied with your job and your salary, if you can have all that you and yours need, did it ever occur to you, that your indecision to join your craftsman's group may be holding another worthy, but not so fortunate a one, from getting his just compensation.

Did it ever occur to you that such an indecision of not helping the other fellow to elevate himself, keeps you from further elevation of your own self.

And to those who are actually in the RUT, and go plodding along day by day, without a setting sun, willing to let those who give of their time and money to carry-on an organization for your benefit.

Did it ever occur to you as you sit and plod, that for a few cents a day, by your decision, you could help those that are trying to help you, trying to make your life easier.

Don't you both realize, that by your indecision, you are keeping a fine body of men from helping you and your craft, your industry, from being the profession that the public expects it to be.

The public wonders in amazement, how a human being can create and repair such a fine instrument as the present day wrist watch, and we of the profession work for a pittance to satisfy the public.

Yes! For $1, $1.50, $2, $3, $5, we wear out our souls, our nerves, our eyes, our health, to the public wonderment. Are we super-humans or just plain fools?

The responsibility is yours, your the man at the bench.

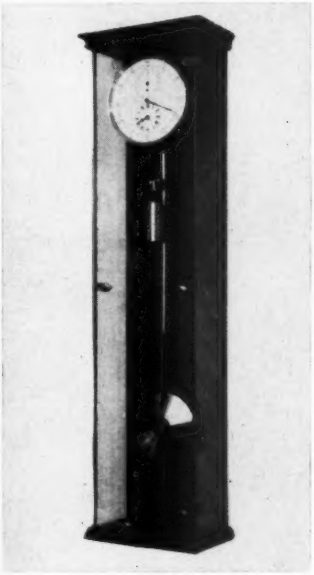
Didn't it ever occur to you that the foundation has been laid, that their exists today in The United Horological Association of America, Inc., an organization of well defined principals for your uplift and the uplift of your craft; to place you and your craft in the direct eyes of your public. To put us all on a higher plane, in the spot that the public expects us to be in, for we are craftsmen of the highest order. *Artisans*, if you will. The very foundations of the *Old World* were built on time.

So, why the indecision, what are you waiting for, life is short. If your life doesn't matter, leave something for your *Son*, for every craftsman that follows you, is your *Son*.

For may the setting sun be ever true,
For in the light that follows you,
Their may be one,
Worthy of your decision.

First Prize—Clock

U. H. A. of A. National Workmanship Competition, Chicago, 1937



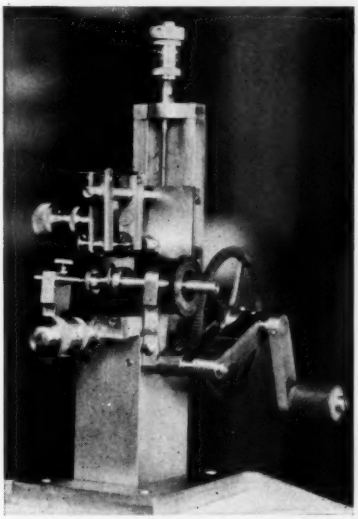
The accompanying reproduction of precision clock constructed by John E. Burg, Chicago, Illinois.

Vacation Time

After twelve strenuous months of activity in instructing young aspirants in the field of Horology and devoting the major portion of his evenings in preparing copy and checking articles of technical nature for THE AMERICAN HOROLOGIST, our Technical Chairman, W. H. Samelius, Director of the Elgin Watchmaker College, will depart August 1st for northern Minnesota to partake of his regular hobby of fishing, accompanied by Mrs. Samelius.

Second Prize—Rounding-Up Tool

U. H. A. of A. National Workmanship Competition, Chicago, 1937



The accompanying reproduction of Rounding-Up Tool, which won second prize, was constructed by Mr. Oscar A. Reum, Chicago, Illinois.

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The Time and Way to Wind Watches

This article from Boston Transcript acts as a part of our program of public education. Other cities and states are doing the same type of work.

WATCHMAKERS who know their profession entertain, as a rule, definite views about everything pertaining to a watch. Usually their notions about the diminutive pocket timepiece are thoroughly in accord. No two watchmakers agree, however, as to what time of the day you should wind your watch in order that it may serve you faithfully every hour of the twenty-four, and not go on strike even a fraction of the time of your waking or your slumbering hours.

Should you wind your watch in the morning when you are getting ready to do your share of the world's work, or upon retiring, as you meditate over the various incidents and occurrences of the day now happily at an end?

Should you wind your watch at night when your mind is more at ease, when the hurry-skurry of the day just passed has bidden you a kindly adieu until the following day? Although the possibilities are, if we are to believe the psychologists, that just when your super-conscious mind—the most vital part of your brain—is in an absent state at that particular time. In other words, the mysterious gray matter after performing the day's work is anxious to be left at rest, and whether you want to or not, it is bound then to be taking a vacation. It respectfully declines your commands that it work overtime even at double-pay, and lets the subconscious mind become the master of the situation. And your subconscious mind, taking the reins of your mental realm, rambles over a number of matters that were accomplished or things left undone.

Now a watch should be wound once in twenty-four hours, about the same time each day. It should be wound with regularity. You will never get accurate time out of a watch if you wind it one day at six in the morning and the following day at midnight. You cannot get uniformity of time-keeping, you cannot have your watch record time for you correctly unless you wind it regularly. Properly, a watch must be wound within two hours of the twenty-four since it was last wound.

There are certain individuals who are known to be scrupulous about retiring every night at the same hour—nay, on a certain fixed minute. With these men and women, disciples and students of scientific or business efficiency—who allow under no condition anyone or anything of any character to upset in the least their prearranged schedule in their "onward march," the premonition that they wind their watches upon retiring is sound and safe. They wind it regularly to the fraction of a minute.

However, as the persons who are "honest-to-goodness" true disciples of efficiency and human perfection are comparatively small in number, we must pay heed to the millions of others, those ordinary mortals with whom there is no "iron clad" fixed hour for retiring at night. The average individual goes to bed one night at nine and the next night at one in the morning. In order that you may wind your watch about the same hour each day it would be well, therefore, to do it the first waking hour in the morning.

Granted that the watch is wound up regularly every twenty-four hours, we are now ready to enter upon the discussion of a new phase in connection with the intricate time-teller that you carry in your pocket or on your wrist.

Is it not better for the watch mechanism that it should be wound up in the morning instead of at night? Would the watch stand a better show if a jar or a fall were to take place, with a wound-up mainspring or a partly run-down one—which would be the case if the watch were wound at night? Will the daytime energetic activity upset the accurate re-

cording of time for which the watch was originally devised, with a wound-up mainspring or a partly run-down one?

The answer is that disturbances of the mildest character would be counteracted more favorably with a wound-up mainspring. A bang or a fall, however, would cause a lot more mischief to a watch that had been wound up a short time ago than to one that was partly run down.

Thus it would seem that the best time to wind your watch is in the morning.

—*Boston Transcript.*

Modern Shop Equipment

(Continued from Page 28)

Points to follow for successful results are given by the manufacturers of the machines and solutions used in them. Keep the jars filled so as to cover the basket when revolving and run only for the length of time recommended in the solutions and for spinning and drying. In some machines difficulty is experienced with the solution whirlpooling and the center of the solution dropping below the top of the basket with the result that the solution is not forced through the basket and contents properly. This can be eliminated by placing baffles around the inside of the jars. Three upright rods, about a quarter of an inch in diameter, connected together with spring wire to hold them against the jars so as to clear the basket will break up the addy and throw the solution to the center of the jar.

A fair trial will convince one that the machine cleans watch parts faster, more perfectly and more economically and gives one more time for the finer details of his work.

As for the use of the timing machine, compare if you will the time taken in the old methods of timing with the convenience and scientific accuracy of a machine that will give you the rating of the watch in all positions in just a few minutes.

Machines such as those described above will elevate our craft in the minds of the public and help to restore the respect and prestige that is our due.

Religion

Religion is telling the truth in a trade,
Without even counting the cost,
And having the courage to stand by the right
Tho fortune and friends may be lost.

Religion is thirty-six inches per yard,
And sixteen full ounces per pound.
And sixty whole minutes of other men's time—
Not watching those minutes roll round.

Religion is meeting the world with a smile,
Then bringing a bright smile back home—
A joy to the loved ones who wait for your step,
No matter how far you may roam.

Religion is turning your back on the wrong,
With a prayer in your heart to do right,
Then stepping forth boldly to conquer yourself
With your face ever facing the light.

Religion is giving a bright word or more,
To those whose dark clouds hide their sun,
If you've got the kind of religion I mean,
You will hear the Master Watchmakers'—Well done.

"Average American" Described at Meet on Social Problems

H. Harry Giles of Ohio State University, speaking at the national conference of school work, described the average American Monday as "a kindly and sympathetic person."

He said the average American (1) wants people employed, but not if it costs time and money, planning and reduction of profits; (2) wants democracy, but not if it goes against his pet beliefs; (3) wants education, but not if it means that his children disagree with him; (4) wants no suffering where he knows about it; (5) wants people to be independent—so long as they follow his suggestions; (6) wants all of the facts—so long as they are agreeable to what he already believes; (7) wants efficiency—so long as it doesn't change his ways, and (8) wants to believe in Santa Claus.

We are very punctual people, buying our cars, our furniture, and clothes on time.

The man who invented the white stripe in the middle of the road has been given a medal. We understand the committee is now searching for the fellow who stays on his side of it.

Best of All.—Three watchmakers who did business on the same street were bitter competitors. One day the first one hung up a new sign. It read—"The best watchmaker in town."

The second chap, not to be outdone, soon put a sign in his window which read — "The best watchmaker in the country."

The third watchmaker looked at the two signs and scratched his head. Shortly afterwards he placed a notice on his door; it said—"The best watchmaker on the street."

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DO YOU KNOW?

Directed by
W. H. SAMELIUS, Chairman
Science of Horology and Technical Advisory Board

Walnut shells are being "reconditioned" to hold watches. They are shown, properly hinged and clasped, with their tiny watches set inside, hung on pigskin fobs with ovals of walnut shells at the ends.

In 1888 the Great Western Watch Company was organized at Indianola, Nebraska; capital stock of $250,000. C. D. Cramer, president; C. S. Quick, vice president, and J. M. Beardsley, treasurer.

In the early days of railroading many station clocks were equipped with two sets of hands. For instance, gilt hands for Washington time, and black hands for local time. These hands were separated by a constant difference equal to the difference of longitude.

The method of friction jeweling is not new. It was attempted many years ago. However, it did not prove successful until of late. With modern methods and machinery, jewels can be made to a very small tolerance, .01MM and with the modern methods of tool making, the holes in the plates can also be held to the same tolerance, so today several of our watch manufacturers are using this system successfully and satisfactorily, so the watchmaker at the bench should acquaint himself with this modern method of jewel setting. There are several tools on the market for doing this work accurately and quickly, and watchmakers should investigate these tools.

The domes of the great Russian churches are plated with gold ¼" thick. The Church of the Savior in Moscow has a coat which costs $15,000,000, and the Isaac Cathedral in St. Petersburg represents three times that amount. Although the church offers the peasantry such fine chances for plunder, they are never touched, as they fear divine vengeance and would rather starve than invoke it.

In the early days watches for the greater part were key winders, and as stem winders became popular key winders then in use became less desirable to their owners. Henry Abott, in January, 1881, patented a stem wind device that could be applied to any American watch of the key wind style, making the key wind over to a modern stem winder.

As early as 1885 the Grand Hotel in Paris was equipped with 700 clocks that were synchronized with a pneumatic system.

Hard work is a good thing, but skill is its master. Knowledge and ability are inseparable if success is the object.

The first attempt to distribute time from a central station may be credited to that many sided genius, Goethe, who more than 150 years ago set up a time ball on Wartberg, a mountain near Heilbrunn, Germany.

Nuremberg, Germany, is referred to as the birthplace of the watch. It was there Heinlien built the first portable timepiece.

In the time of Alfred the Great, the Persians imported into Europe a machine which represented the first rudiments of a striking clock. It was brought as a present to Charlemange from Abdallh, King of Persia, by two monks of Jerusalem, in the year 800 A.D.

Do You Know These Things About Our Flag?

That the twenty-fourth star of the Flag was added for Missouri?

That Congressional resolution determining the design for our flag was adopted June 14, 1777?

That the Stars and Stripes may claim antiquity among national flags? Here are the dates on which various national flags were established:

Great Britain, 1801; France, 1894; Portugal, 1815; Spain, 1785; Italy, 1848.

That the width of a stripe on a flag is always half the length (in inches) of the flag's longest measurement?

That the flag of our navy is a blue field with a star for every state?

That the President's flag is a spread-eagle on a blue field, surmounted by a row of 13 stars, and is trimmed with yellow fringe?

That regimental flags for infantry are blue; for cavalry, yellow?

That the first blood on foreign soil in a battle under the American Flag was in Ireland?

That the Flag was first carried around the world on the ship Columbia, sailing from Boston, Sept. 30, 1787, and returning Aug. 10, 1790?

That at the beginning of the war between states there were 34 stars in the union of the Flag?

To tell summer temperatures correctly, a popular science note informs us, all you have to do is count the number of times a tree cricket chirps in a second and add forty. Another way is to look at the thermometer.

A Smile

A smile costs nothing,
But gives much.
It enriches those who receive,
Without making poorer
Those who give.
It takes but a moment
But the memory
Sometimes last forever.
None is so rich
Or mighty
That he can
Get along without it.
A smile creates
Happiness in the home,
Fosters good will
In business
And is the countersign
Of friendship.
It brings rest
To the weary,
Cheer to
The discouraged,
Sunshine to the sad
And is nature's
Best antidote
For trouble.
Yet it cannot be bought,
Begged, borrowed or stolen
For it is something
That is of no value
To any one
Until it is given away.
Some people are too tired
To give you a smile.
Give them one of yours,
As none need a smile
So much
As he who has
None to give.

—*Selected.*

Patronize Our Advertisers
Mention "The American Horologist"

NATIONAL AFFILIATES
Prepare Now for
1938 CONVENTION—BOSTON, MASSACHUSETTS
MAY, 16-17-18, 1938

Fabulous "Crown of Andes" May Be Exhibited

Valued at $4,500,000, the fabulous "Crown of the Andes" has been offered as a glittering exhibit at San Francisco's 1939 Golden Gate International Exposition. The offer was made by Warren Piper, Chicago jeweler representing the American syndicate which brought the beautiful mass of gold and jewels from South America.

In the crown are 453 emeralds with a total weight of 1523 carats. The central stone is a 45-carat emerald, said to have been worn by Atahualpa, last Emperor of the Incas, when he was captured by Spaniards in 1532. The crown was originally fashioned as a token to the Virgin Mary, from spoils of the marauding Pizarro. It has been the cause of endless bloodshed and was desired by the late Czar Nicholas of Russia.

Mention "The American Horologist"

Horological Guild of Spokane

On the evening of July 19th, the Horological Guild of Spokane, held its second meeting in the store of Willis and Redding with twenty watchmakers present.

After reading minutes of last meeting, permanent officers were elected as follows: F. L. Rauch, president; G. E. Overjorde, vice-president; Harold C. Kelly, secretary; Daniel Maguire, treasurer.

After election of permanent officers, the temporary president turned the meeting over to the president elect, F. L. Rauch, who appointed several committees who will start work on their respective fields at once.

There was much enthusiasm evident, and the membership committee hopes to add several new members before the next meeting, scheduled for August 3rd.

HAROLD C. KELLY, *Secretary.*

The

E. & J. SWIGART COMPANY

"A Good Supply House"

34 West Sixth Street
CINCINNATI, OHIO

L & R Machine Distribution Spreads

Representatives of the largest watchmakers' supply houses in Switzerland, France, New Zealand, Ireland and the Scandinavian countries attended a demonstration of the L & R Electric Watch Cleaning Machines given by Mr. Max Lazarus at the offices of Anglo-American Products, Ltd., in London, England.

Frankly skeptical about the machine as against the hand cleaning method used by master watchmakers, they unanimously approved the L & R machine after being shown its simple, easy operation and efficient results. "It was like an international convention with all of them talking and gesticulating at once!" said Mr. Lazarus, describing their enthusiasm and excitement when they realized the possibilities provided by the machine cleaning method. "Why, they even went so far as to figure out how much time it would save, to be devoted to more lucrative work."

On the return trip, Mr. Lazarus was very ill, but has since recovered and is again active.

Mention "The American Horologist"
Patronize Our Advertisers

No Danger There.—Insurance Man: "You want your office furniture insured against theft?"

Manager: "Yes, all except the clock. Everybody watches that."

Swartchild Announces New Bench Chair

Swartchild & Company has recently announced their exclusive marketing of a new bench chair for watchmakers and jewelers. Known as "Health Bench," this chair has several features undoubtedly of great interest to all.

Setting out to devise and construct a bench chair which would eliminate fatique and discomfort for the user, the Swartchild Company, after some months of experiment, feels that the "Health Bench" chair accomplishes this goal.

The most important feature is the two way adjustable back rest which gives support to the small of the back and against which, as watchmakers who have already tried this chair say, it is remarkably comfortable to rest every few minutes, rather than remaining constantly hunched over the bench as is generally the habit of most watchmakers.

Furthermore, the "Health Bench" chair is equipped with friction tight casters which make it convenient for the watchmaker to roll over to his materials, etc., and eliminate the getting up and down, which every watchmaker does many times a day.

The "Health Bench" chair is adjustable to suit any individual user's height, and is solidly constructed of steel.

The price is $8.95, and to facilitate purchase for those who already own an ordinary stool, a liberal trade-in allowance of $1.50 is offered.

Use **SECURITY MAINSPRINGS**

They run and rate the watch Correctly

Your customer will be pleased with results

Watch Material Supply Houses have them. Ask for and insist upon

"SECURITY"

Imported exclusively by
The Newall Mfg. Co.
CHICAGO

Master Watchmakers' Association of Colorado, Inc.

Colorado Watchmakers held their Fifth Annual Convention, July 11, 1937, at Colorado Springs, Hotel Antlers. A goodly representation from all sections of the state was present. Reports from all counties and guilds were very interesting, and a general display of renewed interest was evidenced.

A Legislative Committee was appointed with Mr. D. E. Heigert as Chairman, who will start preparation for our legislative acts at once. Colorado is strongly in favor of the licensing of watchmakers, and the State Organization went on record as being in favor of a bill to govern the sale of used and rebuilt watches.

Mr. Henri Grusin was elected as State Membership Chairman, and plans to build the State Organization membership up to its original quota.

It was regularly moved that the State Charter be closed January 1, 1938. All applicants from January 1st on, will be subjected to an initiation fee of $5.00, together with the regular yearly dues. This will also apply to reinstatements at that time.

Officers elected for the ensuing year: President, E. E. Peterson, Denver; Vice-Presidents: Henry Grusin, Littleton; Fred Comstock, Boulder; Fred Weiss, Greeley; A. J. Bradley, La Junta; G. T. Wilson, Colorado Springs; C. A. Watson, Pueblo; O. D. Allen, Florence; Treasurer, A. E. Beebe, Denver; General State Secretary, O. R. Hagans; National Trustee, Wolf C. Hansen; State Technical Chairman, Jes I. Hansen; Assistant, D. E. Heigert.

(Signed) O. R. HAGANS,
General State Secretary.

MARTIN GLUCK & SONS
Jewelers and Watchmakers Supplies
CLARK BUILDING
PITTSBURGH, PA.

Wisconsin Watchmakers' Association

From the Secretary of Wisconsin we receive most encouraging statements relative to their recent adventure in the licensing of all watchmakers in their state, and he states: "Everything is going fine. Registrations are coming in rapidly, and we have succeeded in stopping price advertising throughout the state. Men who defied NRA have fallen into line under our law, and it has done much to raise the morale of the watchmakers. Wages are already increasing and I know that by this fall, there will be a shortage of good watchmakers in Wisconsin. I have never seen the watchmakers with a feeling of confidence and hope that they have in Wisconsin at this time.

"Since our law has gone into effect and I have seen the working of it, I know that I could draw a bill that would be better in some respects than we have now. However, we intend to improve on it from time to time until we have just what we want and need. The main thing is to have a law on which to improve, as it is harder to get in than it is to stay in."

We may add that since the passage of Wisconsin's law, the watchmakers of that state have seen, and now realize, a greater necessity for a state and national organization. This has been definitely proven through the tremendous increase in membership in their state since the passage of this bill.

Patronize Our Advertisers
Mention "The American Horologist"

The newly rich woman was trying to make an impression: "I clean my diamonds with ammonia, my rubies with Bordeaux wine, my emeralds with Danzig brandy, and my sapphires with fresh milk."

"I don't clean mine," said the quiet woman sitting next to her. "When mine get dirty, I just throw them away."

Helpful Books for the Horologist

Send Orders to THE AMERICAN HOROLOGIST, 3226 E. Colfax Ave., Denver, Colo.

The Watchmaker's Handbook

By Claudius Saunier. Translated from the French of Claudius Saunier, and enlarged by Julien Tripplin, F.R.A.S., and Edward Rigg, M.A. Over 500 pages. New eighth edition. 14 folding plates. **Price, $5.00**

Horology—The Science of Time Measurement and the Construction of Clocks, Watches and Chronometers.

By Eric Haswell, F.P.H.I. This new book is one of the best yet produced on this subject. The author has explained the principles of operation and the constructional details of clocks, watches and chronometers. Appropriate historical facts are embodied when necessary. 267 pages.
Price, $7.00

Watch Repairing, Cleaning and Adjusting.

By F. J. Garrard. Covers the Cleaning and Repairing of Watches. Treats on the materials and tools used. Shows how to alter and adjust all kinds of English and Foreign Watches, Repeaters, Chronographs and Marine Chronometers. 214 pages. Ninth edition. Illustrated by over 200 engravings. **Price, $3.00**

Watch and Clock Makers' Manual.

By F. W. Britten. This book covers a large scope of practical repair work and embraces every type of watch from the early English Fusee to the modern wrist watch.

The use of the lathe and attachments is given thorough treatment.

The treatment of the hair spring is given considerable space, in a non-technical manner, with a description of forming breguet springs at the bench.

A section devoted to clocks is also included, and all known practical escapements are described in a manner easily grasped by the workman. 361 pages, 150 illustrations. **Price, $3.00**

The Junior Watchmaker.

By A. G. Thisell. Dealing with the lever escapement adjusting. **Price postpaid, $3.00**

Practical Balance and Hairspring Work.

By Walter J. Kleinlein. Beautifully bound in imitation Morocco, gilt edges, 115 pages, 43 illustrations. **Price postpaid, $3.50**

With the Watchmaker at the Bench.

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The Marine Chronometer—Its History and Development.

By Lieut. Com. Rupert, T. Gould, R.N., F.R.G.S. The only book of its kind, over 300 pages, 40 full page photographs, and 85 drawings.
Price postpaid, $8.00

The Lure of the Clock.

By D. W. Hering. Every bench man and store should possess this book. 121 pages, 99 beautiful illustrations. **Price postpaid, $4.00**

Rules and Practice for Adjusting Watches.

By Walter J. Kleinlein. Beautifully bound gilt edges, 108 pages well illustrated.
Price postpaid, $3.50

Modern Methods in Watch Adjusting.

By Harold C. Kelly. Cloth bound, 126 pages and 13 illustrations. **Price postpaid, $2.65**

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By C. F. C. Gordon. With which is incorporated the more important portion of "Clocks, Watches, and Bells," by the late Lord Grimthorpe, relating to Turret Clocks and Gravity Escapements. By G. F. C. Gordon, M.A., A.M.I.C.E., Superintendent of Workshops of the Engineering Department of Cambridge University. A practical book of special interest to the Clockmaker and Repairer. 232 pages. Fully illustrated by diagrams and plates of Long Case, Bracket and other Clocks, Dials, Hands, etc. **Price, $5.00**

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The American Horologist

Volume No. 1, 400 pages, over 230 illustrations, bound in beautiful black imitation leather, gold embossed, prepaid.
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Watchmaker—Best of references, wishes permanent position where ability is appreciated. will not consider temporary work. Address Box 43, The American Horologist.

HELP WANTED

The National Employment Bureau has numerous positions open for every type of workman. If desirous of making a change or securing a position, direct your mail, including qualifications, location and expected salary, to Employment Department, United Horological Association of America National Headquarters, 3226 East Colfax Ave., Denver, Colo.

WANTED

Book—titled "Ways & Means, by Cleaves", covering split chucks and staking toolpunches, published by Spain & Chamberlin, N. Y. Address Box 27, the American Horologist.

Wanted — Material and tool catalogues earlier than the year 1890. Address The American Horologist.

BLUEPRINTS

Working drawings for construction of wooden Columbus Clock consisting of a set of 15 blueprints for $3.25 postpaid. Address THE AMERICAN HOROLOGIST.

Working drawings for the complete construction of pinwheel movement clock consisting of eleven blue prints postpaid for $3.00 per set. Address The American Horologist.

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ADVERTISING MATERIAL

Send to Advertising Department National Headquarters for free samples showing prepared advertising material designed for newspaper, letter, cards and counter circulars, mats, plates, etc.

Master Watchmakers' Association of Oregon

The Master Watchmakers' Association of Oregon announces that their next meeting will be held in September, at which time election of officers will be held and the future course of their association planned. Legislative action will no doubt be one of the paramount subjects discussed at this time.

(Signed) HAROLD SABRO.

Toledo Guild

We, of the Toledo Guild, deeply regret the recent death of one of our charter members, Mr. G. H. Rodenhauser, who was very active in our guild work, and will be greatly missed by us all.

C. & E. Marshall Company begs to announce the appointment of a new manager for their Pittsburgh office. Mr. M. A. Rougeux of Toledo, Ohio, formerly president of the Toledo Guild.

The watchmakers and jewelers in this section will be served most satisfactorily by Mr. Rougeux, who has for the past several years, taken an exceedingly interesting part in the advancement of our horological profession.

It has been said that if all the learned and scientific men, of every age, could meet in deliberative assembly, they would choose Sir Isaac Newton for their President.

Convention Transcript

Those wishing 1937 Convention Transcript may secure same at this time for the payment of $2.50, to National Headquarters.

For National and Local Information Contact the Following Organizations

Who function as a combined unit for the advancement of our craft. Membership at large represented in virtually every state.

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Four New Time and Labor Savers

From Paulson's
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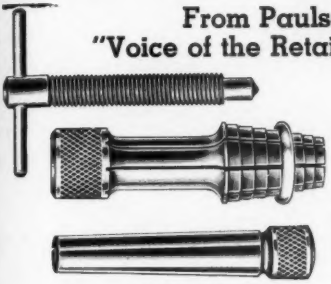


Above Illustration

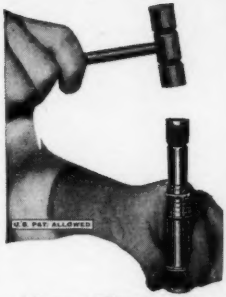
About half size, shows beautiful finish of these splendidly made tools.

New Rathbun All-Size Ring Sizer

No. 11183 — Simple to use. Sizes ladies' or gents' rings without marring surface. Easy, simple quick. Complete,

$3.85

Less 2% for Cash



Above Illustration

Shows simple method of quickly sizing rings.

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Paulson Rust Solvent and Remover. Works like magic. Place solution on rust spot. In one minute's time rust can be wiped away, leaving a clean, natural surface. Complete with dropper. Per oz. bottle..... **25c**

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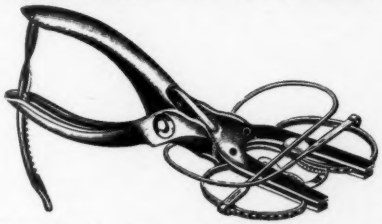

Equipped with ratchet grip. Holds frame and other articles surely and safely.
No. 10300. Regular price, $1.50.
Our special offer, each net..... **95c**

These exclusive Paulson time and labor savers shown only in the Voice. Ask for it. Sent free, postage paid, to all legitimate watchmakers and jewelers.

Paulson Friction Jewel Setter, complete with jewels at new low prices.

USE THIS HANDY COUPON

HENRY PAULSON & CO.

Please ship the following at once and oblige.

- ☐ New Rathbun all-size ring stretcher set $3.85
- ☐ Paulson Rust Remover. Per bottle..... 25c
- ☐ No. 10300 Paulson Soldering Clamp Plier 95c
- ☐ Paulson Friction Jewel setter, complete with plate, balance and cap jewels.... $24.80

Prices less 2% for cash

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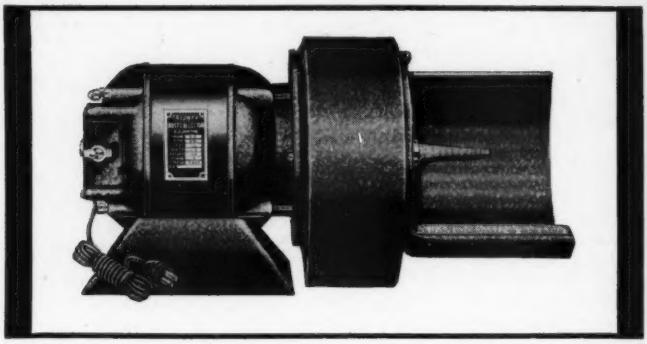

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COMPLETE WITH POLISHING MOTOR

The Triumph Dust Collector will protect your health and provide a new source of income for you. This portable bench model Dust Collector employs a new principle—a ¼ H.P. (3450 R.P.M.) motor drives both the rotary suction fan and the polishing spindle. Besides, the hood features a special slide adjustment and it can be set at any angle to accommodate extra large objects. Dust bag conveniently located in rear. Requires only an 18" space. Shipping weight, 45 lbs. And, of course, the biggest feature of all is the typical Swartchild low price—the Triumph Dust Collector complete sells for little more than the price of a good polishing motor alone.

No. AH5253008. Triumph Dust Collector complete with motor, polishing spindle, cord, plug and two dust bags

(or $4.95 per month for ten months)

$49.50

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World's Largest Watchmakers' and Jewelers' Supply House

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